

CONQUERING CUSTOMER HEARTS : INTELLIGENT HYPER-PERSONALIZATION WITH ARTIFICIAL INTELLIGENCE FOR ENHANCED CUSTOMER ENGAGEMENT

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ABSTRACT

Indonesia is undergoing a rapid digital transformation, characterized by the integration of artificial intelligence (AI) across diverse sectors. AI possesses the potential to reshape consumer behavior and unlock novel opportunities for businesses, including the educational sector, to cultivate more personalized relationships with customers through hyper-personalization. This research seeks to examine the effects of Artificial Intelligence and Hyper-Personalization on customer engagement, aiming to contribute to the advancement of more efficient marketing strategies in the digital era. The study primarily explores how AI-driven personalized marketing strategies impact customer interactions and loyalty toward products and services. Employing a quantitative methodology, the study gathers data from 246 respondents with expertise in digital marketing. An online questionnaire distributed via Google Forms was used for data collection, and analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with WarpPLS version 8 software. The research instrument applied a 5-point Likert scale. The results indicate that both Artificial Intelligence (AI) and Hyper-Personalization significantly and positively affect Customer Engagement. Additionally, AI has a strong and positive influence on Hyper-Personalization. The study also finds that Hyper-Personalization serves as a mediator between AI and Customer Engagement; however, its impact diminishes due to inconsistencies between Hyper-Personalization and the diverse content nature of social media platforms catering to varied audiences. These findings provide valuable insights into how AI-driven marketing strategies can strengthen business-customer relationships. While AI enhances engagement through personalization, more generalized content that appeals to a broader audience proves to be more effective, particularly for social media marketing within educational institutions.

Keywords: Artificial Intelligence; Hyper-personalization; Customer Engagement; Educational Institution; Digital Marketing

ABSTRAK

Indonesia mengalami transformasi digital yang pesat dengan integrasi kecerdasan buatan (AI) di berbagai sektor. AI berpotensi mengubah perilaku konsumen dan membuka peluang baru bagi bisnis, termasuk sektor pendidikan, untuk menjalin hubungan yang lebih personal dengan pelanggan melalui hyper-personalization. Penelitian ini bertujuan untuk menganalisis pengaruh Artificial Intelligence dan Hyper-Personalization terhadap tingkat keterlibatan pelanggan (Customer Engagement), dengan harapan dapat memberikan kontribusi pada pengembangan strategi pemasaran

yang lebih efektif di era digital. Fokus utama penelitian ini adalah untuk menganalisis bagaimana strategi pemasaran yang dipersonalisasi menggunakan kecerdasan buatan dapat mempengaruhi interaksi dan loyalitas pelanggan terhadap produk dan layanan yang ditawarkan. Penelitian ini menggunakan pendekatan kuantitatif dengan jumlah sampel 246 responden yang memiliki pengetahuan tentang digital marketing. Data dikumpulkan menggunakan kuesioner online melalui Google Form dan dianalisis menggunakan PLS SEM dengan perangkat lunak WarpPLS versi 8. Instrumen penelitian menggunakan skala Likert 5 poin. Hasil penelitian menunjukkan bahwa Artificial Intelligence (AI) dan Hyper-Personalization berpengaruh positif dan signifikan terhadap Customer Engagement. AI juga terbukti berpengaruh positif dan signifikan terhadap Hyper-Personalization. Hyper-Personalization memediasi pengaruh AI terhadap Customer Engagement, meskipun terjadi penurunan signifikansi karena ketidaksesuaian antara Hyper-Personalization dengan karakteristik konten media sosial yang ditujukan untuk audiens yang beragam. Penelitian ini memberikan wawasan tentang bagaimana penerapan AI dalam pemasaran dapat menciptakan hubungan yang lebih kuat antara perusahaan dan pelanggan. Meskipun AI dapat meningkatkan keterlibatan pelanggan melalui personalisasi, penggunaan konten yang lebih umum dan dapat diterima oleh berbagai kalangan akan lebih efektif, terutama untuk konten media sosial pada institusi pendidikan.

Kata Kunci : Kecerdasan Buatan; Hyper-personalization; Customer Engagement; Perguruan Tinggi; Pemasaran Digital

INTRODUCTION

Indonesia is experiencing a swift digital transformation, marked by the widespread adoption of artificial intelligence (AI) across various sectors. (Sipayung et al., 2022). AI has emerged as a versatile technology capable of creating significant value in multiple industries (Misnawati, 2023). Around 90% of consumers rely on smartphones and other digital platforms in their daily activities (Hadi & Zakiah, 2021) to obtain detailed product information. In the future, AI is expected to develop capabilities that enable machines to learn and think like humans (Mahmudah, 2023). This transformation has a profound impact on various aspects, such as technology adoption intention (Fahruri, 2023), customer satisfaction, customer service, purchase intention, and repurchase intention (Bawinto & Loindong, 2024). Consequently, AI's potential to influence consumer behavior opens new opportunities for businesses to establish more personalized and relevant relationships with their customers. As digital technology continues to advance, industries across the board are experiencing significant shifts, including the education sector, which is undergoing major transformations, particularly in marketing management. These changes are pushing educational institutions to innovate by adopting digital technology to enhance the

effectiveness of their marketing efforts and expand their reach to prospective students (Yandra & Suriyanti, 2024).

Online promotion has evolved into a crucial strategy to promoting products with services diverse digital platforms, including web browser, social network, and mobile platforms, which are widely embraced by businesses. This practice involves various techniques, from display advertising to content marketing, aimed at effectively reaching target audiences (Maihani et al., 2023). Technological advancements have introduced AI into the marketing landscape, allowing for deeper data analysis and more accurate predictions. This facilitates been used AI methods, e.g. Knowledge engineering, in marketing strategies for improve personalization, efficiency, and overall campaign effectiveness. Typically, this process requires substantial time to determine the right content and understand its impact on modern marketing (Taufik & Kurniawan, 2023). Therefore, businesses must develop marketing strategies that align with customer needs by tailoring content to meet individual preferences (Chandra et al., 2022).

Digital technology enables companies to provide highly personalized customer experiences through hyper-personalization (Singh & Kaunert, 2024). In other words, businesses can implement personalization strategies thanks to a deeper and faster understanding of consumer preferences and behaviors. This information can then be leveraged to customize marketing content on an individual level, increasing the relevance and appeal of the messages conveyed (Maihani et al., 2023).

Customer engagement is a key factor in business success, influenced by satisfaction, positive emotions, and trust (Widiyanto, 2024). When customers feel connected to a brand and its products, and customers who feel valued are more likely to stay committed and frequently return to make additional purchases (Widiyanto, 2024). AI along with hyper-personalization offer tremendous potential to enhance customer engagement by delivering more relevant and satisfying experiences. Through in-depth data analysis and a better understanding of consumer behavior, AI helps businesses identify individual needs and preferences, enabling the delivery of more relevant and compelling messages (Taufik & Kurniawan, 2023).

Although extensive research has been conducted on customer engagement (Widiyanto, 2024; Erwin et al., 2023; Colicev et al., 2018; Ernantyo & Febry, 2022) and its connection to artificial intelligence (Taufik & Kurniawan, 2023; Rantung, 2023;

Nirwana, 2023; Rachmad et al., 2024), studies linking these aspects to hyper-personalization remain scarce. Furthermore, higher education institutions as research subjects have not been widely explored. Given this gap, the present seeks to examine the effects of artificial intelligence and hyper-personalization on customer engagement levels, with the expectation of contributing toward creating more efficient marketing scheme in the digital era. The primary focus of this research is to investigate how Intelligent systems driven personalized marketing strategies influence customer interactions and loyalty toward offered products and services. Research aspires to offer meaningful perspectives on the ways-driven marketing can strengthen relationships between businesses and customers while fostering sustainable growth in the digital age.

LITERATURE REVIEW AND HYPOTHESIS

Digital Marketing

Technological advancements are an inevitable part of the modern era, making every innovation created a means to bring positive benefits, enhance convenience, and introduce new ways of carrying out human activities (Waqfin et al., 2021). The increasing use of digital marketing in social network content creation has the potential to boost purchase intentions (Erwin et al., 2023). As a result, digital marketing has become essential and cannot be overlooked (Waqfin et al., 2023). Social media serves as a crucial tool in digital marketing, playing a significant role in fostering customer engagement (Gołab-Andrzejak, 2022). Customer engagement itself is a key factor influencing purchase intention, as it reflects attachment, loyalty, and trust (Margitarino et al., 2022). A well-structured digital marketing strategy that aligns with consumer market segmentation can further enhance consumer confidence in making purchasing decisions (Antarizkia & Arif, 2022). Moreover, digital marketing provides an advantage in evaluating conversion data more efficiently by leveraging information technology to assess the effectiveness of applied strategies, making it far superior to conventional marketing methods (Antarizkia & Arif, 2022). From a financial perspective, digital marketing is relatively more cost-effective than traditional marketing approaches (Hadi & Zakiah, 2021). Additionally, it enables greater time efficiency, eliminating the need for direct consumer outreach since content marketing can now be scheduled and uploaded automatically at predetermined times (Hadi & Zakiah, 2021).

Social Media

The success of marketing directly influences online purchasing decisions, especially in today's rapidly advancing and highly digital era, where the target audience is vast (Taufik & Kurniawan, 2023). The utilization of social media has grown increasingly prevalent a dominant phenomenon in contemporary human life (Ningsih et al., 2023). Over the past few years, media application for example Instagram, Twitter, Facebook, alongside Tiktok have reshaped the way people interact with one another, creating new communication patterns (Ningsih et al., 2023). Social media has grown into a vital tool in order to companies and to create closer relation to both existing and potential customers. It enables direct interaction with consumers, fosters brand awareness, and enhances the visibility of products and services (Setiawan & Purwanto, 2024). These objectives can be further achieved through effective content management, utilizing unique, engaging, and trend-driven content to boost audience reach and increase viewership rates (Setiawan & Purwanto, 2024).

Artificial Intelligence (AI)

Artificial Intelligence significantly shapes and transforms the landscape of digital marketing has been a widely discussed topic for at least the past five years, as AI has shown itself to be an invaluable resource in the field, particularly in generating content tailored to individual needs (Nirwana, 2023). With AI-driven tools and strategies, businesses can more accurately identify and target specific client segments (Rachmad et al., 2024). The incorporation of AI within marketing became a reality following advancements in technology and algorithms that enable deeper data analysis and more precise predictions (Taufik & Kurniawan, 2023). This development has paved the way for the application of various AI techniques, such as machine learning, within marketing strategies to enhance personalization, efficiency, and campaign effectiveness.

Traditionally, determining the right, high-quality content with a significant impact requires a considerable amount of time (Taufik & Kurniawan, 2023). With machine learning, however, the effectiveness of content selection improves significantly, ensuring more accurate targeting (Rantung, 2023). For instance, GPT has emerged as one of the most prominent machine learning models, utilizing an autoregressive transformer-based decoder that processes all words in a sequence simultaneously through a self-attention mechanism. Trained on next-word prediction tasks based on

preceding words, GPT is capable of generating coherent text (Rantung, 2023). Therefore, Artificial Intelligence enables leveraged to analyze the examination from audience behavior, personalization of marketing content, understand customer preferences through data analysis, creation of both textual and visual campaign materials, thus effectively evaluation of marketing outcomes (Nirwana, 2023).

Hyper-Personalization (HP)

The Hyper-Personalization approach has gained significant popularity as a means to establish stronger customer associations, driven by companies' efforts to provide high-quality services (Rochmawati et al., 2023). Consequently, businesses are redesigning their operations through digital transformation to ensure seamless customer interactions across all digital touchpoints (Rochmawati et al., 2023). While digital transformation brings innovation and competitive advantages, the digital landscape remains uncertain, posing high risks in bridging the gap between traditional approaches and digital solutions (Wibowo, 2024).

Customers now have elevated expectations regarding personalized service experiences when making purchases (Erwin et al., 2024). Approximately 90% of consumers rely on smartphones and other digital platforms to access detailed product information (Hadi & Zakiah, 2021). To meet these expectations, businesses must craft marketing content that aligns with individual customer needs (Chandra et al., 2022). Products act as catalysts in the customer journey, reflecting lifestyle choices, preferences, and purchasing behaviors. In this context, personalization strategies present valuable opportunities for marketers by enabling them to tailor content that resonates with each customer's specific needs (Chandra et al., 2022).

Customer Engagement (CE)

Customer engagement refers to the degree of intensity with which customers interact with a product or brand (Erwin et al., 2023). A strong indicator of effective customer engagement is continuous and repeated interactions between customers and a product or brand, which indirectly contribute to the psychological, emotional, and physical investment that customers demonstrate toward corporation product either brand (Erwin et al., 2023; Colicev et al., 2018). The diverse manifestations of customer engagement suggest that it is a concept that can be approached from multiple perspectives, as long as these perspectives effectively capture and explain the nature of

customer interactions. Such insights can then be extrapolated to examine marketing strategies aimed at encouraging desirable customer behaviors or preventing undesirable ones, such as brand switching (Ernantyo & Febry, 2022).

Customer satisfaction holds crucial contribution to strengthening customer loyalty. Customer who are satisfied tend to stay committed to a company, repeatedly experiencing satisfaction from the same provider, and willingly recommending the brand to others (Setiawan & Purwanto, 2024). Implicitly, digital marketing enhances customer satisfaction, as consumers are more content when their social media platforms display the products they anticipate. As a result, digital marketing greatly enhances customer satisfaction (Colicev et al., 2018).

Hypothesis

This study proposes four hypotheses derived based on insights from the literature review and the established research model outlined in Figure 1, including:

Artificial Intelligence in Customer Engagement

In the realm of digital marketing, the utilization of diverse Artificial Intelligence (AI) technologies is implemented techniques has become increasingly common as part of marketing strategies aimed at enhancing personalization, efficiency, and campaign effectiveness. This is particularly relevant given that determining the right, high-quality, and impactful content typically requires a considerable amount of time (Taufik & Kurniawan, 2023). As a result, AI facilitates greater customer engagement on social media platforms (Gołab-Andrzejak, 2022). The implementation of AI-driven recommendations, which have undergone personalization processes in online markets, can greatly improve customer interaction, boost buying interest, and maintain a competitive edge in a highly dynamic marketplace (Rahma et al., 2024).

H1: Artificial Intelligence has a positive and significant impact on Customer Engagement.

Artificial Intelligence in Hyper-Personalization

With the integration of technology-driven tools and strategies, businesses can more accurately identify and target specific customer segments (Rachmad et al., 2024). One such approach is Hyper-Personalization, which goes beyond traditional marketing segmentation by leveraging Artificial Intelligence to analyze large volumes of data, reveal valuable insights, and empower brands to create experiences that are not only

focused on the customer but also highly tailored to individual needs (Guendouz, 2024). Consequently, companies are increasingly redesigning their business models through digital transformation to address all customer touchpoints across digital platforms (Rochmawati et al., 2023).

H2: Artificial Intelligence has a positive and significant impact on Hyper-Personalization.

Hyper-Personalization in Customer Engagement

The Hyper-Personalization approach has gained increasing recognition and is widely implemented to foster stronger customer relationships, as companies strive to provide high-quality services (Rochmawati et al., 2023). Hyper-Personalization on social media has also become more prevalent with the growing number of users, generating large volumes of data regarding of desires and requirement of consumers. Consequently, the success of digital marketing significantly influences purchasing decisions, given the extensive reach it aims to achieve (Taufik & Kurniawan, 2023). This wealth of data can be leveraged by companies to create personalized experiences, ultimately enhancing customer satisfaction, loyalty, and engagement (Nurhayati et al., 2024).

H3: Hyper-Personalization has a positive and significant impact on Customer Engagement.

Artificial Intelligence in Customer Engagement with Hyper-Personalization as a Mediator

Consumer engagement is a key factor that reflects the level of attachment, loyalty, and trust customers have, which in turn influences their purchase intentions (Margitarino et al., 2022). The implementation of highly personalized digital marketing strategies tailored to consumers' specific preferences can strengthen their confidence in making purchasing decisions (Antarizkia & Arif, 2022). In other words, Hyper-Personalization fosters deep customer engagement by delivering content, recommendations, and promotions customized to each customer's preferences (Rane et al., 2023). Therefore, with various AI-powered tools enhanced by Hyper-Personalization, **Artificial Intelligence can be utilized to gain insights into target markets or audiences, tailor marketing content for increased relevance, and evaluate consumer behavior and preferences using more precise data and insights (Nirwana, 2023).

H4: Hyper-Personalization Mediates the Influence of Artificial Intelligence on Customer

RESEARCH METHOD

Respondent

The study determined the number of participants based on established standards. According to some researchers, a sample size of at least 150 respondents is adequate for Structural Equation Modeling (SEM) analysis (Anderson & Gerbing, 1988). In contrast, other experts argue that a simple SEM model requires a minimum of 200 respondents (Kline, 2015). Taking these recommendations into account, this research utilized a sample of 246 respondents. These participants were selected for their understanding of digital marketing, ensuring they could grasp the influence of Artificial Intelligence (AI) and Hyper-Personalization on Customer Engagement. The data was collected through an online questionnaire distributed via Google Forms, with all 246 respondents completing the survey. The participants were recruited from various universities in Makassar. Of the 290 questionnaires initially distributed, 246 responses were deemed valid for analysis, representing a response rate of 84.83%. The distribution of the Google Form was assisted by colleagues, resulting in an uneven spread of responses across the universities. Although some respondents were located near the research team and could have met in person, they were still required to complete the survey online. The data collection period spanned from August to December 2024.

Measurement

The instrument used in this study is a questionnaire utilizing a five-point Likert scale, where a score of 1 indicates strong disagreement, and a score of 5 represents full agreement. Each statement in the questionnaire is designed based on indicators derived from previous studies. The variables in this research include independent variables Artificial Intelligence (AI) and Hyper-Personalization (HP) as well as the dependent variable, Customer Engagement (CE). Additionally, Hyper-Personalization (HP) acts as a moderating factor in the connection between Intelligence (AI) and also Customer Engagement (CE).

The indicators used in this study are:

- Artificial Intelligence (AI) Variable include Attraction to the target university's social media content due to Creative Content Ideas (AI1), Attraction to the target

university's social media content due to Visually Appealing Images (AI2), Attraction to the target university's social media content due to Engaging Animations (AI3), Attraction to the target university's social media content due to Compelling Text or Captions (AI4), Attraction to the target university's social media content due to Clear and Informative Content (AI5), and Attraction to the target university's social media content due to Interactive Videos (AI6).

- Hyper-Personalization (HP) encompasses several factors: the frequency of receiving social media content from the targeted university that matches the user's interests or desires (HP1), the frequency of content that aligns with the user's needs (HP2), the frequency of content that reflects the user's habits (HP3), the frequency of content that corresponds to the user's behavior or attitude (HP4), the frequency of content that suits the user's lifestyle (HP5), the frequency of content that aligns with the user's search history (HP6), the level of interest in content that matches the user's preferences (HP7), and the sense of being understood and emotionally connected when the university's social media content resonates with the user's preferences (HP8). Customer Engagement (CE) variables in this study include visits made to the targeted university (CE1), likes given by users on the targeted university's social media account (CE2), following the targeted university's social media account (CE3), sharing content from the targeted university's social media account (CE4), comments left on the targeted university's social media content (CE5), interest in the targeted university after viewing its social media content (CE6), desire to enroll in the targeted university after viewing its social media content (CE7), recommendations of the targeted university given to friends or relatives (CE8), Emotional response (feeling emotionally engaged) after viewing the targeted university's social media content (CE9).

Analysis

The analytical approach employed in this research is Partial Least Squares - Structural Equation Modeling (PLS-SEM). This method was selected due to the non-normal distribution of the collected data (Hair et al., 2017; Febryaningrum et al., 2024). PLS-SEM is recognized for its robustness in evaluating models with non-normal data and its emphasis on predictive accuracy (Hair et al., 2012; Hair et al., 2021). The data analysis was conducted using WarpPLS version 8.

Result

Goodness of Fit Test

The findings from the data analysis reveal the following: the Average Path Coefficient (APC) is 0.495 with a significance level of $P < 0.001$; the Average R-Squared (ARS) is 0.515, also with $P < 0.001$; and the Average Adjusted R-Squared (AARS) is 0.512, again with $P < 0.001$. The Average Block Variance Inflation Factor (AVIF) stands at 2.046, which is considered acceptable as it is below the threshold of ≤ 5 and ideally ≤ 3.3 . Similarly, the Average Full Collinearity VIF (AFVIF) is 2.283, also within the acceptable range of ≤ 5 and ideally ≤ 3.3 . The Tenenhaus Goodness-of-Fit (GoF) value is 0.544, classified as small if ≥ 0.1 , medium if ≥ 0.25 , and large if ≥ 0.36 . Furthermore, the Simpson's Paradox Ratio (SPR) is 1.000, which is acceptable if ≥ 0.7 and ideally equals 1. The R-Squared Contribution Ratio (RSCR) is also 1.000, meeting the acceptable criterion of ≥ 0.9 and ideally 1. The Statistical Suppression Ratio (SSR) is 1.000, acceptable if ≥ 0.7 , and the Nonlinear Bivariate Causality Direction Ratio (NLBCDR) is 1.000, also within the acceptable range of ≥ 0.7 . These results indicate that the developed model and the instruments employed are suitable for implementation, as supported by Hair et al. (2017) and Sholihin & Ratmono (2020), as presented in Table 2.

Validity Test

The validity of this study is assessed using Convergent Validity indicators, which include loading factor values, Average Variance Extracted (AVE), and discriminant validity (Hair et al., 2017; Erwin et al., 2024). An ideal loading factor value is > 0.7 , the results suggest that the indicator is effective in measuring the intended construct. In social research, a loading factor value ranging from 0.40 to 0.70 is still deemed acceptable (Hair et al., 2017). According to these standards, the validity test for Artificial Intelligence (AI), Hyper-Personalization (HP), and Customer Engagement (CE) satisfies the validity criteria, as their values surpass 0.70 (AI1, AI2, AI3, AI4, AI6, HP1, HP2, HP3, HP4, HP5, HP6, HP7, HP8, CE2, CE6, CE7). However, certain loading factor values are below 0.70 (AI5, CE1, CE3, CE4, CE5, CE8, CE9). Despite this, following the validity guidelines for social research (Hair et al., 2017), values within the 0.40 to 0.70 range can still be considered valid if their significance is less than 0.001, as illustrated in Table 3.

The subsequent phase in evaluating convergent validity involves analyzing the AVE (Average Variance Extracted) values for each variable. The recommended AVE threshold is a minimum of 0.5, indicating that a construct accounts for at least 50% of the variance in its indicators when the AVE is 0.5 or higher (Wong, 2013; Sarstedt et al., 2017). Based on this criterion, the AVE values for each variable are as follows: AI = 0.808, HP = 0.796, and CE = 0.660, all of which exceed the 0.50 threshold, as detailed in Table 3.

The final step in assessing discriminant validity involves examining cross-loadings. Strong discriminant validity is established when an indicator's correlation with its latent variable is stronger than its correlation with other variables (Nusrang et al., 2023). The findings reveal that all constructs in the evaluated variables exhibit higher correlations with their respective latent variables compared to their cross-loadings with other variables. Consequently, the discriminant validity test for these variables meets the required standards, with the specific values provided in Table 3.

Reliability Test

The reliability testing can be conducted by analyzing the value of internal consistency, represented by the reliability of the data is assessed using Cronbach's Alpha coefficient and Composite Reliability. Data is deemed reliable if the Composite Reliability value is above 0.70 and the Cronbach's Alpha value surpasses 0.60 (Lukita & Sudibjo, 2021, p. 153). The findings from the reliability test reveal that the research instrument exhibits strong reliability. As illustrated in Table 2, both the Cronbach's Alpha and Composite Reliability values for all constructs meet the required thresholds. variables are ≥ 0.70 . Specifically, the Cronbach's Alpha values are AI = 0.891, HP = 0.917 and CE = 0.836, while the Composite Reliability values are AI = 0.918, HP = 0.932 and CE = 0.873.

Hypothesis Test

Hypothesis testing in this study was conducted by processing data using WarpPLS software version 8. To assess the relationships between variables, we examined the beta coefficient (β) reflects the direction of influence: a positive β suggests a favorable impact, whereas a negative β implies an adverse effect. Additionally, we considered the rho value (ρ) to determine statistical significance. An

effect is deemed statistically significant if the rho values is below than 0.05 (Hair et al., 2017; Sholihin & Ratmono, 2020).

This research examined four hypotheses: H1, H2, H3, and H4. The results confirm that all proposed hypotheses are supported. Specifically, H1 demonstrates that Artificial Intelligence (AI) has a positive and significant impact on Customer Engagement (CE), with H1 ($\beta=0.527$, $p<0.001$). H2 indicates that Artificial Intelligence (AI) positively and significantly influences Hyper-Personalization (HP), with H2 ($\beta=0.705$, $p<0.001$). H3 confirms a positive and significant relationship between Hyper-Personalization (HP) and Customer Engagement (CE), with H3 ($\beta=0.254$, $p<0.001$). Finally, the findings for H4 reveal that Hyper-Personalization (HP) mediates the relationship between Artificial Intelligence (AI) and Customer Engagement (CE), with H4 ($\beta=0.179$, $p<0.001$).

The outcomes related to H4 show that the mediating effect is smaller compared to the direct effect of Artificial Intelligence (AI) on Customer Engagement (CE). Data analysis further confirms the presence of partial mediation in Customer Engagement (CE). This suggests that Hyper-Personalization (HP) acts as a bridge that is still a significant direct effect of the independent variable on the dependent variable, even though the relationship between them is mediated. Given the nature of this effect, this type of partial mediation is categorized as complementary partial mediation.

Discussion

In the field of online marketing, social networking platforms play a crucial rolehas increasingly solidified its presence. It has evolved beyond its original purpose of facilitating social connections to serve as an essential platform for businesses to market and sell their products (Erwin et al., 2022). The incorporation of social media into marketing strategies applies across various industries, allowing businesses to leverage its potential in shaping brand identity, uncovering their unique value propositions, building brand awareness, and even achieving better marketing performance compared to competitors, including fostering customer interaction and involvement (Stockdale et al., 2012; Setiawan & Purwanto, 2024; Popescu & Tulbure, 2022).

As a result, Artificial Intelligence (AI) is widely adopted in marketing to enhance operational efficiency, deliver faster customer service, improve personalization, and create highly targeted content for specific market segments (Maihani et al., 2023).

Consequently, implementing AI-driven recommendations that have undergone personalization processes can greatly improve customer engagement, influence buying decisions, and maintain a competitive edge in the market (Rahma et al., 2024). This is consistent with the author's findings, which show that AI implementation has a strong and positive effect on customer engagement, especially in the context of social media content for higher education institutions.

Hyper-Personalization strategies can also be facilitated through AI to curate personalized experiences tailored to meet customer expectations (Guendouz, 2024), ensuring that marketing content aligns with customers' needs and preferences (Chandra et al., 2022). Thus, Artificial intelligence holds a vital function in helping businesses understand customer behavior, needs, and preferences to implement personalization strategies that remain relevant (Nirwana, 2023). AI enables the processing of vast amounts of data with high accuracy, allowing businesses to identify patterns and trends that are often difficult for humans to recognize, as well as predict future customer actions and decisions (Taufik & Kurniawan, 2023). This research concludes that the implementation of Hyper-Personalization is positively and significantly influenced by the use of AI.

Afifah & Putri (2023) discovered that individualized strategies, including personalized product suggestions, customized interactions, and proactive support, play a crucial role in enhancing customer satisfaction and fostering loyalty. The author's findings are consistent with this research, showing that implementing Hyper-Personalization strategies positively and significantly influences customer engagement.

Various AI-driven technologies powered by Hyper-Personalization could be utilized for better gain deeper insights into target demographics and consumer groups, tailor content strategy for higher relevance, and analyze consumer behavior and preferences through more precise data analysis (Nirwana, 2023). However, this study reveals that when Hyper-Personalization mediates the impact of AI on customer engagement, the effect remains positive but experiences a decrease in significance. This decline is attributed to a mismatch between Hyper-Personalization and the nature of social media content, which often targets a diverse audience, such as in higher education institutions. While Hyper-Personalization may be effective for specific audiences, such

as prospective students, the same content may not be as relevant for other groups, such as parents of prospective students, who have different preferences.

Thus, while AI can create personalized experiences to enhance customer engagement, excessive individualization of content may lead to a narrower reach. As a solution, using more generalized content that appeals to a broader audience may be more effective, particularly for social media content intended for educational institutions. Over-personalization can also overwhelm audiences or reduce their interest. A more generalized strategy allows audiences to feel engaged without feeling pressured or disconnected from the context.

CONCLUSION

Indonesia is undergoing a rapid digital transformation, as Artificial Intelligence (AI) becomes more embedded in different industries, including marketing. From the research, aims to analyze the influence of AI and hyper-personalization on customer engagement in educational institutions, especially in higher education, aims to offer insights for developing more effective marketing strategies in the digital age. AI facilitates a more profound understanding of consumer behavior and facilitates content personalization to enhance customer engagement, including in the education sector.

Digital marketing that leverages AI and Hyper-Personalization strategies presents opportunities To establish more meaningful and customized connections between businesses and customers. While the implementation of AI in marketing strategies and the adoption of Hyper-Personalization have shown that AI has a positive and significant impact on customer engagement; however, when Hyper-Personalization acts as a mediator in the context of social media content for higher education institutions, its influence becomes less significant—though it still remains positive. This decline can be attributed to the misalignment of Hyper-Personalization with a diverse audience, such as prospective students and their parents, who have varying preferences. Therefore, while AI is effective in personalizing content, a more generalized marketing strategy that appeals to a broader audience has proven to be more effective in fostering customer engagement on social media, particularly in the higher education sector.

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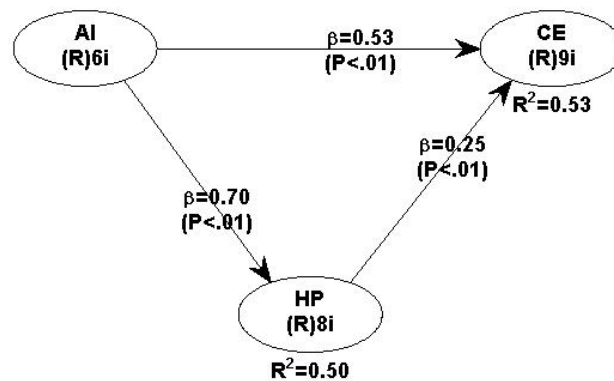
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FIGURES AND TABLES OF DATA PROCESSING RESULTS

Figure 1. Research Model, Path Coefficients and P-Values



Source: Researcher Data Processing Result, 2025

Table 1. Respondent Characteristic

Age	Amount	%
14 - 17 years old	10	4,07
18 - 24 years old	228	92,68
25 - 34 years old	4	1,63
35 - 44 years old	0	0
45 - 54 years old	4	1,63
55 years older	0	0
Total	246	100,00

Gender	Amount	%
Men	88	35,77
Women	158	64,23
Total	246	100,00

Status	Amount	%
Prospective student	16	6,50
College student	226	91,87
Parents of the student	4	1,63
Total	246	100,00

Education	Amount	%
Senior High School	35	14,23
Bachelor Degree (S1)	202	82,11

Master Degree (S2)	7	2,85
Doctoral Degree (S3)	2	0,81
Total	246	100,00

Commonly Used Social Media	Amount	%
Instagram	234	45,97
TikTok	187	36,74
Facebook	27	5,30
Linkedin	46	9,04
Whatsapp	5	0,98
X	4	0,79
Weibo	1	0,20
YouTube	2	0,39
Telegram	1	0,20
Line	1	0,20
Snapchat	1	0,20
Total	509	100,00

Source: Researcher Data Processing Result, 2025

Table 2. Goodness of Fit Test Result

Goodness of Fit Indicators	Requirements	Score
Average path coefficient (APC)	$P < 0.05$	0.495, $P < 0.001$
Average R-squared (ARS)	$P < 0.05$	0.515, $P < 0.001$
Average Adjusted R-squared (AARS)	$P < 0.05$	0.512, $P < 0.001$
Average block VIF (AVIF)	Acceptable if ≤ 5 , ideally ≤ 3.3	2.046
Average full collinearity VIF (AVIF)	Acceptable if ≤ 5 , ideally ≤ 3	2.283
Tenenhaus GoF (GoF)	Small ≥ 0.1 , medium ≥ 0.25 , large ≥ 0.36	0.544
Simpson's paradox ratio (SPR)	Acceptable if ≤ 0.7 , ideally ≤ 1	1.000
R-squared contribution ratio (RSCR)	Acceptable if ≤ 0.9 , ideally ≤ 1	1.000
Statistical suppression ratio (SSR)	Acceptable if ≥ 0.7	1.000
Nonlinear bivariate causality direction ratio (NLBCDR)	Acceptable if ≥ 0.7	1.000

Source: Research Data Processing Result, 2025

Table 3. Validity Test Result

Variable and Indicator	Loading Factor	P Value	Cross-Loadings			AVE
	Customer Engagement (CE)		CE	AI	HP	0,660
CE1	0,603	<0,001	0	-0,406	0,207	
CE2	0,705	<0,001	0	-0,210	0,008	
CE3	0,649	<0,001	0	-0,349	-0,081	
CE4	0,580	<0,001	0	-0,444	0,111	
CE5	0,580	<0,001	0	-0,011	0,067	

CE6	0,737	<0,001	0	0,576	-0,233
CE7	0,748	<0,001	0	0,446	-0,190
CE8	0,631	<0,001	0	-0,081	0,202
CE9	0,684	<0,001	0	0,259	0,008
Artificial Intelligence (AI)					0,808
AI1	0,825	<0,001	0,009	0	-0,085
AI2	0,861	<0,001	0,056	0	-0,148
AI3	0,845	<0,001	-0,151	0	-0,048
AI4	0,816	<0,001	-0,003	0	0,026
AI5	0,636	<0,001	0,092	0	0,377
AI6	0,840	<0,001	0,048	0	-0,027
Hyper-Personalization (HP)					0,796
HP1	0,788	<0,001	-0,021	-0,099	0
HP2	0,806	<0,001	0,003	-0,103	0
HP3	0,813	<0,001	-0,008	0,114	0
HP4	0,827	<0,001	0,117	0,037	0
HP5	0,791	<0,001	0,015	0,205	0
HP6	0,795	<0,001	-0,108	0,112	0
HP7	0,787	<0,001	0,046	-0,193	0
HP8	0,756	<0,001	-0,050	-0,092	0

Source: Researcher Data Processing Result, 2025

Table 4. Reliability Test Result

Variable	Cronbach Alpha/CA	Composite Reliability/CR
Customer Engagement (CE)	0,836	0,873
Artificial Intelligence (AI)	0,891	0,918
Hyper Personalization (HP)	0,917	0,932

Source: Researcher Data Processing Result, 2025

Table 5. Hypothesis Test Result

Hypothesis	Results	
H1 : Artificial Intelligence has a positive and significant effect on Customer Engagemen	$\beta=0.527, p<0.001$	<i>H1 accepted</i>
H2 : Artificial Intelligence has a positive and significant effect on Hyper-Personalization	$\beta=0.705, p<0.001$	<i>H2 accepted</i>
H3 : Hyper-Personalization has a positive and significant effect on Customer Engagement	$\beta=0.254, p<0.001$	<i>H3 accepted</i>
H4 : Hyper-Personalization mediates the effect of Artificial Intelligence on Customer Engagement	$\beta=0.179, p<0.001$	<i>H4 accepted</i>

Source: Researcher Data Processing Result, 2025